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S/181/63/005/001/048/064
B108/B180

247500

AUTHORS: Yelisseyev, P. G., and Kalashnikov, S. G.

TITLE: The recombinative properties of nickel in germanium

PERIODICAL: Fizika tverdogo tela, v. 5, no. 1, 1963, 320-326

TEXT: To clear up discrepancies in published data on the electron trapping cross sections of Ni and Ni⁺ in p-type Ge, the authors studied the lifetime of the excess carriers in dependence on temperature, nickel concentration, and dislocation density. It was measured by two methods: (1) compensation of the photomagnetic effect by photoconductivity, (2) attenuation of photoconductivity. The results were the same in the range 120 - 330°K. The Ge crystals were doped with nickel by diffusion, either from an electrolytic layer onto the sample's surface or from a solution of nickel in molten lead. The results were qualitatively the same and showed only a slight quantitative difference (20 - 30%). At low Ni concentrations, the lifetime-versus-temperature curve has two plateaus, with the lifetime falling with decreasing temperature in between. As the Ni concentration increases, the curve maintains its two plateaus, but the

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lifetime in the intermediate section tends to increase with falling temperature (G. K. Wertheim: Phys. Rev., 115, 37, 1959). The higher the dislocation density, the higher is the Ni concentration required for this transition. α_n^- , the coefficient of electron trapping by Ni^- ions, is greater than α_n^0 , the coefficient of electron trapping by neutral Ni ions. α_n^0 is virtually independent of temperature. The temperature dependence of α_n^- could not be established. At 300°K, $\alpha_n^- = 3 \cdot 10^{-9}$ and $\alpha_n^0 = 0.5 \cdot 10^{-9}$ cm³/sec. There are 5 figures and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: August 14, 1962

Card 2/2

ACCESSION NR: AP4039689

S/0181/64/006/006/1900/1902

AUTHOR: Yunovich, A. E.; Yeliseyev, P. G.; Nakhodnova, I. A.;
Ormont, A. B.; Osadchaya, L. A.; Stuchabnikov, V. M.

TITLE: Radiative recombination in Zn-diffused GaAs p-n junctions

SOURCE: Fizika tverdogo tela, v. 6, no. 6, 1964, 1900-1902

TOPIC TAGS: recombination radiation, radiative recombination,
electroluminescence, p n junction, GaAs laser, GaAs diode, semi-
conductor laser, laser, junction laser, injection laser

ABSTRACT: Recombination radiation from Be-doped GaAs p-n junctions
was investigated with a view toward possible laser application of Be-
doped GaAs injection diodes. The GaAs with a carrier concentration
between $5 \cdot 10^{17}$ and 10^{18} cm^{-3} was diffused with Be in vacuum at
950C. The junction was about $3 \cdot 10^{-3} \text{ cm}^2$. In one of the diodes the
junction was 30 μ deep. Two parallel planes were cleaved perpendic-
ular to the junction. The recombination radiation spectra were
obtained by injecting carriers with current pulses up to 100 amp.
The pulse duration was 1.2 μsec and the repetition rate was 50 cps.

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ACCESSION NR: AP4039689

The recombination spectra at 77K show that the intensity of emission is very similar to that of Zn-doped GaAs diodes. The maximum occurs at 1.47 eV. The line width at half maximum and at a current density of $2.8 \cdot 10^3$ amp/cm² was 0.014 eV. Some narrowing and nonlinear increase of intensity were observed at high current densities. Analysis of current-voltage characteristics and recombination spectra shows that Be is an acceptor impurity. The maximum solubility of Be in GaAs was found to be greater than 10^{18} cm⁻³. Radiative recombination in Be-doped GaAs has a higher degree of probability than in GaAs doped with Zn. Assuming that radiative recombination in Zn-doped GaAs is due to transitions between the conduction band and the acceptor levels, the energy level formed by Be is close to that of Zn in GaAs. The narrowing of the line was believed to be caused by stimulated emission, which fact would indicate the possibility of obtaining laser action in degenerate GaAs doped with Be. Orig. art. has: 2 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

Card 2/3

ACCESSION NR: AP4039689

SUBMITTED: 20Jan63

SUB CODE: SS

ATD PRESS: 3059

NO REF SOV: 002

ENCL: 00

OTHER: 006

Card 3/3

ACCESSION NR: AP4039693

S/0181/64/006/006/1908/1910

AUTHOR: Yunovich, A. E.; Yeliseyev, P. G.; Ormont, A. B.;
Osadchaya, L. A.; Stuchebnikov, V. M.

TITLE: Structure of coherent radiation spectra from GaAs p-n
junctions

SOURCE: Fizika tverdogo tela, v. 6, no. 6, 1964, 1908-1910

TOPIC TAGS: GaAs laser, semiconductor laser, laser, junction laser,
injection laser, coherent emission, coherent emission spectrum

ABSTRACT: The structure of recombination radiation emitted by GaAs
p-n junction lasers operating at 77K was investigated. The diodes were
fabricated by diffusion of zinc into GaAs wafers. The carrier concen-
tration of GaAs was about $7 \cdot 10^{17} \text{ cm}^{-3}$. The carriers were injected
by applying current pulses of 8 to 100 amp. The duration of the
pulses and the repetition rate were 1.2 μsec and 50 cps, respectively.
For different diodes the threshold current density varied between
 $2.6 \cdot 10^3$ and $11 \cdot 10^3 \text{ amp/cm}^2$. One to three lines, about 2 \AA or less
wide, appeared near the main emission peak at the threshold current.

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ACCESSION NR: AP4039693

As the current density was increased, the number of peaks (all of which appeared in a longwave part of the spectrum 7—35 Å wide) increased to 10—15, and the main peak was shifted into this spectral region. Some overlapping of neighboring lines was observed. The line width at half maximum varied from less than 1 Å to 2.5 Å. The separation between the majority of the adjacent peaks was 3.5 ± 0.7 Å. The intensity of the main peak was highest for diodes with the smallest number of maxima and the least shifting. In such diodes the series resistance determined from the current-voltage characteristics was slightly lower than in other diodes. Such lasers were also characterized by a sudden increase of current at a voltage of about 1.47, and by a thinner p-n transition region. The structure of the emission spectra was explained on the basis of an earlier paper (P. P. Sorokin, J. D. Axe, J. R. Lankard, J. Appl. Phys., 34, 2553, 1963), in which it was shown that spectral components of continuously emitting GaAs lasers correspond to different cavity modes. It was calculated that the diode temperature increased by 5—15K during the duration of the pulse. This was in agreement with the experimentally observed temperature variation. Orig. art. has 2 figures.

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ACCESSION NR: AP4039693

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V.
Lomonosova (Moscow State University)

SUBMITTED: 03Feb64

ATD PRESS: 3059

ENCL: 00

SUB CODE: SS

NO REF SOV: 001

OTHER: 008

Card 3/3

L 3632-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) LJP(c) WG/AT

ACCESSION NR: AF5021358

UR/0120/65/000/004/0180/0182

621.315.592:621.378.325

AUTHOR: Yeliseyev, P. G.; Yunovich, A. E.

TITLE: The production of semiconductor lasers by cleavage shearing

SOURCE: Pribery i tekhnika eksperimenta, no. 4, 1965, 180-182

TOPIC TAGS: semiconductor laser, semiconductor single crystal, laser, laser theory

ABSTRACT: Cleavage shearing is being successfully used for the production of injection lasers from semiconductor crystals. In this short survey article the authors discuss 1) the basic advantages offered a priori by the shearing method; 2) the basic difficulties encountered during the application of this production procedure; and 3) the advantageous use of certain peculiarities of crystals if one of the main crystallographic axes coincides with the diffusion direction. The experimental results of coherent diode laser investigations of the authors have been published earlier. "The authors thank V. S. Vavilov and also E. A. Poltoratskiy, L. A. Osadchey, V. M. Stuchebnikov, I. A. Nakhodnov, and A. B. Gromov for useful discussions and help during the study." Orig. art. has: 3 figures.

Card 1/2

L 3632-66

ACCESSION NR: AP5021358

ASSOCIATION: Fizicheskij fakul'tet MGU (Physics Department, MGU)

44,55

3

SUBMITTED: 10 July 64

ENCL: 00

SUB CODE: EC,SS

NO REF SOV: 001

OTHER: 002

BYK

Card 8/2

L 2972-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EMP(k)/ENA(m)-2/ENA(h) SCTB/LJP(c) WG
 ACCESSION NR: AP5021726 UR/0386/65/002/002/0058/0063

AUTHOR: Yeliseyev, P. G.; Novikov, A. A.; Fedorov, V. B.

TITLE: The effects of optical interaction of two diode lasers

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 2, 1965, 58-63

TOPIC TAGS: laser, diode laser, gallium arsenide, gallium arsenide laser, injection laser, semiconductor laser, optical interaction

ABSTRACT: The optical interaction of two diode lasers placed less than 5 μ apart was studied experimentally. The gallium arsenide p-n diodes obtained by cleaving a single crystal into two parts 425 and 1450 μ long, were placed in the same plane in liquid nitrogen and pumped by square-wave current pulses with an amplitude of 0.5—2.5 amp and a duration of 1.5 μ sec from two oscillators. The emission spectra were observed by means of ISP-51 and DFS-8 spectrographs and were recorded by an FEU-22 photomultiplier. The emission spectra of the 425- μ (short) and 1450- μ (long) diodes were in the $\lambda_{\text{short}} = 8420\text{—}8435 \text{ \AA}$ and $\lambda_{\text{long}} = 8465\text{—}8478 \text{ \AA}$ regions, respectively, and consisted of modes spaced 1.7 \AA and 0.8—0.9 \AA apart, respectively. The optical interaction was evidenced when during the pulse coincidence the relative

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ACCESSION NR: AP5021726

maxima of the λ_{short} and λ_{long} lines changed correspondingly; moreover, a decrease in the λ_{short} and an increase in the λ_{long} line intensities were observed from the short diode side, while an increase in the intensity of both lines was observed from the long diode side. Thus, the optical interaction effect, as observed from the short diode side, was the decrease in line intensity from the short diode side due to the introduction of an external emission into its active medium, and, from the long diode side, an increase in the intensities of both lines due to the time coincidence of pumping pulses. The optical interaction is further explained in terms of the effect of coupled modes on the population of the energy levels. Orig. art. has: 2 figures. [YK]

ASSOCIATION: Institut tochnoy mekhaniki i vychislitel'noy tekhniki Akademii nauk SSSR (Institute of Pure Mechanics and Computer Technology, Academy of Sciences, SSSR)

SUBMITTED: 25May65

ENCL: 00

SUB CODE: EC, OP

NO REF SOV: 000

OTHER: 005

ATD PRESS: 4109

BVK

Card 2/2

L 1379-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/1JP(c)

ACCESSION NR: AP5022443 WG

UR/0109/65/010/009/1729/1730

621.378.325.001.5:621.383.52

AUTHOR: Ambartsunyan, R. V.⁴⁴; Basov, N. G.⁴⁴; Yeliseyev, P. G.⁴⁴; Zuyev, V. S.⁴⁴
Kryukov, P. G.; Stoylov, Yu. Yu.⁴⁴

TITLE: The measurement of the time parameters of a giant pulse laser by means of a photodiode ^{25, 44}

SOURCE: Radiotekhnika i elektronika, v. 10, no. 9, 1965, 1729-1730

TOPIC TAGS: giant pulse laser, gallium arsenide, photodiode, resolving time, Kerr cell, photomultiplier

ABSTRACT: The time-dependent characteristics of a giant pulse laser switched by a Kerr cell were measured by means of a gallium arsenide photodiode. The photodiode was obtained by diffusion of cadmium into n-type GaAs with a $2 \times 10^{18} \text{ cm}^{-3}$ concentration of tellurium during a period of 60 hr. The depth, thickness, and area of the p-n junction were 80μ , 0.9μ , and $2.5 \times 10^{-3} \text{ cm}^2$, respectively. The photodiode was pumped at right angles by a nonfocused laser beam and the pulse width from the photodiode (connected across a 75-ohm load) was 40 nanosec at room temperature, and 20 nanosec at 77K. The results indicate that the resolving time of the

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ACCESSION NR: AP5022443

photodiode is not greater than 5 nanosec, a quality which makes it competitive with photomultipliers. Unlike photomultipliers, which introduce a signal time lag, photodiodes are capable of accurately determining the time lag of a laser pulse released by the Kerr cell. The experimental value of the lag was 80 nanosec. Orig. art. has: 2 figures. [YK]

ASSOCIATION: none

SUBMITTED: 09Dec64

ENCL: 00

SUB CODE: EC

NO REF SOV: 001

OTHER: 001

ATD PRESS: 4092

Card 2/2

"APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001962610003-3

L 57545-65

ACCESSION NR: AP5014611

APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001962610003-3"

L 23297-66 FBD/EWT(1)/EWT(m)/EEQ(k)-2/T/EWP(t)/EWP(k)/EWA(h) TJP(c)
 ACC NR: AP6012506 WG/JD SOURCE CODE: UR/0181/66/008/004/1283/1285

AUTHOR: Yeliseyev, P. G.; Ismailov, I.; Nashel'skiy, A. Ya.; Ostrovskaya, V. Z. 47

ORG: Physics Institute im. P. N. Lebedev AN SSSR, Moscow, (Fizicheskiy institut AN SSSR) B

TITLE: Coherent radiation of an indium arsenide-phosphide p-n diode
 1 1 1 1

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1283-1285

TOPIC TAGS: coherent radiation pn diode, indium arsenide, indium phosphide, solid state laser, infrared laser

ABSTRACT: InPAs crystals were obtained by two-temperature step-by-step synthesis (A. Ya. Nashel'skiy, Byull. izobret., no. 12,40, 1966) in conjunction with oriented crystallization. Subsequent treatment of synthesized specimens (P = 94%, As = 6%) containing large (1 cm³) seeds was similar to that used in the preparation of GaAs diode lasers. The diffusion of the acceptor impurity (Zn) from ZnAs₂ was carried out in a sealed tube at 750C during a period of 30 min. Fabry-Perot type resonators were used with distances between mirrors of 0.5 and 0.35 mm. Coherent radiation from these specimens was at 0.942 μ and the threshold current densities at 77K were from 2.5 to 6.0 x 10³ amp·cm⁻². Line narrowing was observed at threshold currents (~5300 amp·cm⁻²) and at 1.5—2 times their value produced spectral widths of

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L 25297-66

ACC NR: AP6012506

-12-15 Å. At superthreshold currents, equidistant (2.6 Å) spiking was observed in the spectrum of stimulated emission from a 35-mm resonator. Orig. art. has: 2 figures. [YK]

SUB CODE: 20/ SUBM DATE: 05Nov65/ ORIG REF: 002/ OTH REF: 005/ ATD PRESS:

4236

Card 2/2

L 27393-66 FBD/EWT(1)/EWT(m)/EEC(k)-2/I/EWP(k)/EWA(h) IJP(e) WG/JD/JG
 ACC NR: AP6015448 SOURCE CODE: UR/0181/66/008/005/1341/1342

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Yeliseyev, P. G.; Lavrushin, B. M.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: A solid solution $\text{GaP}_x\text{As}_{1-x}$ laser excited by a beam of fast electrons

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1341-1342

TOPIC TAGS: laser, semiconductor laser, coherent radiation, gallium phosphide, gallium arsenide

ABSTRACT: Laser action at nitrogen temperature is reported in n-type $\text{GaP}_x\text{As}_{1-x}$ excited by a beam of 50-keV electrons. The GaP concentration was about 20% and that of uncontrolled donor impurities, $\sim 10^{17} \text{ cm}^{-3}$. The $\text{GaP}_x\text{As}_{1-x}$ samples were obtained by epitaxial growth through gas transport reactions. The dimensions of the sample were $0.48 \times 0.75 \times 2.5 \text{ mm}$. The Fabry-Perot cavity (cavity length 0.48 mm) was prepared by polishing the sides of the sample. The experimental arrangement was similar to that used in electron beam excitation of GaAs (Fizika tverdogo tela, v. 6, no. 1, 1966, p. 21) except that a monochromator with a resolving power of 3 \AA was used instead of the spectrometer. The pulse duration and the repetition rate were 2 \mu sec and 60 pps , respectively. At current densities (j) less than 0.3 amp/cm^2 spontaneous emission peaked at a wavelength of 8300 \AA (half-width of about 1000 \AA).

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L 2393-66

ACC NR: AP6015448

Above $j = 0.3 \text{ amp/cm}^2$ a second peak appeared at approximately 7000 \AA . The intensity of the peak at 7000 \AA increased much faster than that at 8300 \AA , so that at $j = 1 \text{ amp/cm}^2$ the intensity of the former peak was 10 times greater than that of the peak at 8300 \AA . Fig. 1. shows the emission spectrum at different values of j . The smallest value of half-width obtained was 12 \AA . The divergence in the plane exposed to the electron beam was $14-15^\circ$. Depending on the quality of the resonator the

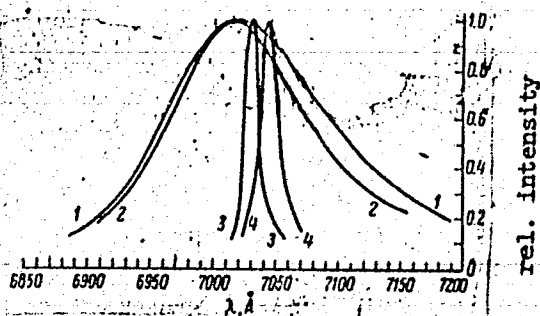


Fig. 1. The emission spectrum of $\text{GaP}_{0.2} \text{As}_{0.8}$

$j, \text{ amp/cm}^2$: 1 - 0.5; 2 - 0.75;
3 - 2.5; 4 - 3.5.

oscillation threshold varied between $j = 1.5-2.5 \text{ amp/cm}^2$. The duration of the laser pulse was not greater than 100 nsec. Orig. art. has: 3 figures. [CS]

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 4257

Card 2/2 90

L 446C-66 EWT(1)/EWT(m)/EEC(k)-2/I/ENP(k)/ENP(t)/ETI IJP(c) WG/JD

ACC NR: AP6030959

SOURCE CODE: UR/0181/66/008/009/2610/2615

AUTHOR: Basov, N. G.; Yeliseyev, P. G.; Ismailov, I.; Yakobson, S. V.; Nashel'skiy, A. Ya.; Pinsker, I. Z.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Certain properties of ²⁷InP lasers ²⁷

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2610-2615

TOPIC TAGS: solid state laser, semiconductor laser, indium phosphide laser, infrared laser, *INDIUM COMPOUND, PHOSPHIDE*

ABSTRACT: Stimulated emission of InP diodes in the 9060—9080 Å region was compared with that of their GaAs counterparts (see Table 1). InP bars were prepared by the directed crystallization method in the form of large-size polycrystals grained in the direction of the bar axis. The bars were tellurium-doped with electron concentrations of $5 \cdot 10^{17} \text{ cm}^{-3}$. The diffusion of zinc from the gas phase into polished plates each containing 2—3 seeds took place at 750C over a 30-min period. The depth of the p-n junction was 35 μ. The electrical contacts were made of gold which was sputtered on plates at 400C. The bar ends were polished and the sides were roughly worked. The GaAs diodes were prepared in a similar manner with the following exceptions: diffusion of zinc into GaAs lasted 4 hr at 850C under excess As pressure, and the resonator

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ACC NR: AP6030959

Table. 1. Basic characteristics of InP and GaAs lasers

	InP	GaAs
Electron concentration in the n-region, cm^{-3}	$5 \cdot 10^{17}$	$5 \cdot 10^{17}$
Electron mobility in the n-region, $\text{cm}^2/\text{v} \cdot \text{sec}$	2000	3200
Concentration of zinc in the gaseous phase during diffusion, cm^{-3}	$3 \cdot 10^{18}$	$7 \cdot 10^{18}$
Diffusion temperature, $^{\circ}\text{C}$	750	850
Diffusion time, hours	0.5	4
Length of Fabry-Perot resonator, mm	0.8	0.9
Wavelength of stimulated emission, \AA	9070	8480
Threshold current density, amp/cm^2	7200	940
Threshold current density after one surface is silvered, amp/cm^2	4700	630
Loss factor α , cm^{-1}	8	8
Gain divided by current density, β , $\text{cm} \cdot \text{amp}^{-1}$	$3.7 \cdot 10^{-3}$	$2.5 \cdot 10^{-2}$

surfaces and diffusion plane were produced by cleavage along the contact plane. The diffusion depth in both cases was almost identical. As regards the width of directivity, InP lasers ($5-7^{\circ}$) were shown to be superior to GaAs lasers ($14-19^{\circ}$) by a factor of 3 or 4. InP laser diodes were characterized by a low loss factor ($\sim 7 \text{ cm}^{-1}$)

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ACC NR: AP6030959

and a gain relatively lower than that of GaAs, expressed in a linear approximation as $k = 3.4 \times 10^{-3} \text{ j cm}^{-1}$, where j (amp/cm²) is the current density. The latter can be due to a lower (than GaAs) quantum yield and to a thick active layer (8—10 μ). The differential efficiencies of the InP laser made it possible to deliver pulsed power of 7 watts at 75 amp at the liquid N temperature. Orig. art. has: 2 tables, 2 figures, and 3 formulas. [YK]

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Card 3/3 *lgm*

L 44601-66

EWT(1)/EWT(m)/EEC(k)-2/T/EWP(k)/EWP(t)/ETI IJP(c) WG/JD/JG

ACC NR: AP6030960

SOURCE CODE: UR/0181/66/008/009/2616/2622

AUTHOR: Basov, N. G.; Yeliseyev, P. G.; Zakharov, S. D.; Zakharov, Yu. P.;
Orayevskiy, I. N.; Pinsker, I. Z.; Strakhov, V. P.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut
AN SSSR)

TITLE: Certain properties of ²⁷GaAs ²⁷laser diodes

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2616-2622

TOPIC TAGS: solid state laser, semiconductor laser, gallium arsenide, laser,
SEMICONDUCTOR DIODE

ABSTRACT: Phenomenological methods were used in an experimental study of certain properties of GaAs laser diodes (loss factor, quantum yield, differential efficiency, gain). The specimens were prepared by the diffusion of zinc into n-type GaAs crystals with electron concentrations of $2 \times 10^{18} \text{ cm}^{-3}$. The cavities consisted of silver mirrors sputtered on polished crystalline surfaces pre-coated with a thin layer of SiO₂, and the electrical contacts consisted of sputtered metal (Au, Ni, In, Sn) films and fused-in electrodes. The measurements were carried out at 77K and the pulsed output was recorded by a calibrated silicon photodiode. The lowest threshold currents occurred in diodes which were cleaved on all four sides. A threshold current of 25 mamp was attained at the liquid He temperature and at a density of 75 amp/cm². C-w operation was observed from diodes with $I_{thr} < 0.5 \text{ amp}$ at 4.2K. The results

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ACC NR: AP6030960

indicate that the transformation of electrical power into optical power occurs with a yield of the order of unity and that the greatest loss is due to absorption in the medium inside the cavity. The loss coefficient for the better diodes was $5-10 \text{ cm}^{-1}$ at 77K, a value which had been theoretically predicted elsewhere. The highest differential efficiency at 77K was 67%, although it was much lower in the case of diodes with Fabry-Perot cavities under high threshold current densities and in four-sided diodes with low threshold current densities. The efficiency of the p-n junctions was 0.5-0.55 with a 25% gain, which took into account losses in series resistance. Efficiencies of 60% were achieved in the case of optimal reflectivity and cavity length. The optical gain in the subthreshold region was $3 \cdot 10^{-2} \text{ cm}^{-1}$.
Orig. art. has: 2 tables, 6 figures, and 9 formulas. [YK]

SUB CODE: 20/ SUBM DATE: 17Jan66/ ORIG REF: 001/ OTH REF: 009/ ATD PRESS: 5078

Card 2/2 *LQM*

ACC NR: AP7001324

SOURCE CODE: UR/0057/66/036/012/2215/2216

AUTHOR: Yeliseyev, P. G.; Man'ko, M. A.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskii institut AN SSSR)

TITLE: Using a semiconductor mirror for the Q-switching of a laser

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 12, 1966, 2215-2216

TOPIC TAGS: laser, ruby laser, laser Q-switching, laser Q-modulation, laser ~~mirror~~, ^{optics}, laser semiconductor mirror

ABSTRACT: The article reports on experiments with germanium and indium antimonide mirrors in a ruby laser to enhance its Q-switching efficiency. The laser was 120 mm long and 9 mm in diameter; its resonator was formed by one end of the rod and a mirror made from a semiconductor material. A telescope was used between the rod end and the mirror to widen the beam incident on the mirror and thereby reduce beam density and its destructive effect on the mirror material. The effect of the arrangement was to change the output from the usual spiking regime to that of giant pulses. Lasers Q-switched by a semiconductor mirror displayed a considerably higher output per unit pumping energy and a much steeper output pulse in comparison with lasers using interference, metal, or polished-end mirrors under free emission near the self-excitation threshold or under conditions of Q-switching by a saturation filter

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ACC NR: AP7001324

and an interference mirror. The multistep character of Q-switched curves, explained by the occurrence of one, two, or more giant pulses in close succession, is less pronounced in the case of semiconductor mirrors because the giant pulses are accompanied by the usual spiking as under conditions of free emission. Orig. art. has: 1 figure. [FP]

SUB CODE: 20/ SUBM DATE: 18Jul66/ CTH REF: 004/ ATD PRESS: 5109

Card 2/2

ACC NR: AP7001323

SOURCE CODE: UR/0057/66/036/012/2213/2215

AUTHOR: Yeliseyev, P. G.; Ismailov, I.; Krasil'nikov, A. I.; Man'ko, M. A.;
Strakhov, V. P.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut
AN SSSR)

TITLE: Temperature dependence of the threshold current of injection-type lasers and
their continuous emission under liquid nitrogen cooling

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 12, 1966, 2213-2215

TOPIC TAGS: laser, injection laser, laser threshold current, laser emission point,
laser emission threshold, laser diode

ABSTRACT: The temperature dependence of the threshold current in the 77—200K range
was investigated on diodes prepared by vapor-phase and liquid-state epitaxy methods.
The vapor-phase specimens were prepared in the conventional way; the epitaxial diodes
were prepared by the liquid-phase epitaxy method (as described by Nelson in RCA
Review, 24, 1963, 603) from a solution of gallium arsenide in gallium at 920C. The
substrates were gallium arsenide p-type plates doped with zinc at a concentration of
about $7 \times 10^{19} \text{ cm}^{-3}$. Graphs of threshold current vs. temperature for two epitaxial
diodes show a linear dependence (gradients of 1.6 and 1.3% per degree). For vapor-
phase specimens, the gradient is 3.9% at 77K; at higher temperatures the gradient
declines slowly. The threshold current densities at 77K for vapor phase diodes lie
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ACC NR: AP7001323

within the 800—2000 amp/cm² range, and for epitaxial specimens, between 1600—8000 amp/cm². A formula is given for the conditions of generation as a function of threshold current, voltage on the junction, thermal resistance of the diode, and diode cross section. The formula shows that, at the nitrogen temperature, the threshold current density should not exceed 5700—5800 amp/cm² for epitaxial diodes and 1900 amp/cm² for vapor-phase diodes. Continuous emission was obtained at 1200—1600 amp/cm² in a number of diodes, but in some the threshold was not reached because of overheating. This result suggests that the actual thermal resistance is 3 to 4 times higher than the calculated value. The difference is attributed to insufficient contact between the diode and the cooling agent. Orig. art. has: 1 figure and 2 formulas. [FP]

SUB CODE: 20/ SUJM DATE: 18Jul66/ ORIG REF: 002/ OTH REF: 012/ ATD PRESS: 5110

Card 2/2

ACC NR: AP6036992

(A,N)

SOURCE CODE: UR/0181/66/008/011/3383/3386

AUTHOR: Yeliseyev, P. G.; Ismailov, I.; Ormont, A. B.; Yunovich, A. E.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet); Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut)

TITLE: Spontaneous radiative recombination in InP p-n junctions at low currents

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3383-3386

TOPIC TAGS: indium compound, phosphide, pn junction, radiative recombination, emission spectrum, volt ampere characteristic, tunnel effect, line shift, temperature dependence

ABSTRACT: The authors investigated the emission spectra and the volt-ampere characteristics of diffusion p-n junctions in InP at 9, 77, and 300K, at current densities up to 10^2 a/cm². Data are presented on the emission of strongly doped InP p-n junctions at a weak injection level, and the presence of several emission bands as demonstrated, including one which is undoubtedly connected with the "diagonal" tunneling of electrons through the p-n junction, similar to that occurring in GaAs diodes. The samples were made from large-block polycrystals of InP, doped with tellurium, and the p-n junctions were produced by diffusion of zinc at 750C. Two groups of samples were prepared, with slightly different volt-ampere characteristics. The emission spectra exhibited three bands, connected with the different transitions which are tentatively identified. The widths of the emission lines are estimated and

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ACC NR: AF6036992

the temperature dependence of the line shift is given. One of the bands is connected with "diagonal" tunneling occurring at small forward bias on the junction (from 0.9 to 1.3 volts at 77K). With increasing voltage (1.35 - 1.40), a strong emission band appears with quantum energy much smaller than the width of the forbidden band, which predominates at high excitation levels and depends little on the current. In addition at 1.2 - 1.4 v a weak band appears, due to radiative transitions to a deep level, with a quantum energy near 1.0 ev. All these processes are similar to those described in the literature for GaAs diodes. The authors thank A. Ya. Nashel'skiy and S. V. Yakobson for supplying the InP crystals. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 19May66/ ORIG REF: 003/ OTH REF: 005

Card 2/2

MEREZHKO, V.G.; YELISEYEV, P.M., inzh., retsontent; TROFIMOV, S.L.,
inzh., red.; SOBAKIN, V.V., inzh., red. [deceased]

[Mechanization of the repair of locomotives in a depot] Me-
khanizatsiia remonta lokomotivov v depo. Moskva, Izd-vo
"Transport," 1964. 198 p. (MIRA 17:5)

SOBOLEVA, Nina Aleksandrovna; BERKOVSKIY, Arkadiy Grigor'yevich;
CHECHIK, Noson Osherovich; YELISEYEV, Reyngol'd
Yevgen'yevich; ZERNOV, D.V., red.; CHEBOTAREVA, A.V., red.

[Photoelectronic instruments] Fotoelektronnye pribory. Mo-
skva, Nauka, 1965. 592 p. (MIRA 18:12)

YELISEYEV, R. YE.

95

8/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo
instituta (Scientific Conference of the Moscow Engineering
Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fivyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Byasanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadse, h-f conductivity of subcritical plasma;

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35

Nauchnaya konferentsiya...

S/089/62/013/006/019/027
B102/B166

design of 30-Mev electron linear accelerator; Ye. G. Pyatnov, A. A. Glashov, V. G. Lopato, A. I. Finogenov, G. M. Skepskiy, V. D. Seleznev, experimental characteristics of low-energy electron linear accelerators; G. A. Zeytlenk, V. M. Levin, S. I. Piskunov, V. L. Smirnov, V. K. Khokhlov, radiocircuit parameters of JYB (LDE)-type accelerators; G. A. Tyagunov, O. A. Val'dner, B. M. Gokhberg, S. I. Korshunov, V. I. Kotov, Ye. M. Moroz, accelerator classification and terminology; O. S. Milovanov, V. B. Varaksin, P. R. Zenkevich, theoretical analysis of magnetron operation; A. G. Tragov, P. R. Zenkevich, calculation of attenuation in a diaphragmated waveguide; Yu. P. Lazarenko, A. V. Ryabtsyev, optimum attenuation length for linear accelerator; A. A. Zhigarev, R. Ye. Yeliseyev, review on trajectographs; I. G. Morozova, G. A. Tyagunov, review on more than 500 ion sources; M. A. Abroyan, V. L. Komarov, duoplasmatron-type source; V. S. Kuznetsov, A. I. Solnyehkov, calculation and production of intense ion beams; V. M. Rybin (Ye. V. Arsenkiy), inductive current transmitters of high sensitivity; V. I. Korona, G. A. Tyagunov, kinetic description of linear acceleration of relativistic electrons; A. D. Vlasov, phase oscillations in linear accelerators; E. L. Burshteyn, G. V. Voskresenskiy, beam field effects in the waveguide of an electron linear accelerator; R. S. Bobovikov,

Card 3/4

MEL'TSER, Vladimir Gil'evich; YELISEYEV, R.Ye., red.

[Electron tubes with secondary emission and their applications] Lampy s vtorichnoi emissiei i ikh primeneniye. Moskva, Izd-vo "Energia," 1964. 23 p. (Massovaia radio-biblioteka, no.514) (MIRA 17:6)

GRINSHTEYN, Mark Mikhaylovich; KUCHIKYAN, Leonid Mikhaylovich;
YELISEYEV, R.Ye., red.

[Photoelectric relays in amateur radio receivers] Foto-
rele v radioliubitel'skoi praktike. Moskva, Izd-vo
"Energia," 1964. 72 p. (Massovaia radiobiblioteka,
no.533) (MIRA 17:6)

YELISEYEV, P.G.; KAN CHAN-KHE [K'ang Ch'ang-ho]; NAKHODNOVA, I.A.

"Inborn" dislocations and recombination in germanium. Fiz.
tver.tela 4 no.10:2880-2884 0 '62. (MIRA 15:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Dislocations in crystals)
(Germanium—Electric properties)

SOBOLEVSKIY, ,natoliy Georgiyevich; YELISEYEV, R.Ye., red.

[Amateur measuring instrument] Liubitel'skii izmeritel'-
skii pribor. Moskva, Energiia, 1965. 23 p. (Massovaya
radiobiblioteka, no.566) (MIRA 18:3)

L 08506-67 EWT(1)/EEC(k)-2 IJP(c) AT

ACC NR: AM6016147

Monograph

UR/ 57
56
B+1

Soboleva, Nina Aleksandrovna; Berkovskiy, Arkadiy Grigor'yevich; Chechik, Noson Osherovich; Yeliseyev, Reynzol'd Yevzen'yevich

Photoelectronic devices (Fotoelektronnyye pribory) Moscow, Izd-vo "nauka", 65. 0592 p. illus., bibio., index. 11,000 copies printed.

Series note: Fiziko-matematicheskaya biblioteka inzhenera

TOPIC TAGS: photoelectric cell, photoconductive cell, photoelectric effect, photoelectron multiplier, photodiode, phototransistor

PURPOSE AND COVERAGE: The book presents basic information on the present state of physics of electronic processes occurring in photoelectronic devices, and describes the design, parameters, and characteristics of these devices. The book is intended for engineers and scientific personnel developing and using photoelectronic devices, and for graduate and undergraduate students at corresponding departments of institutions of higher learning.

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Ch. II. Physical principles of photoelectric effect -- 27

Ch. III. Photomissive cells -- 102

Ch. IV. Photomultipliers -- 203

Ch. V. Photoconductive cells -- 392

Ch. VI. Barrier-layer cells -- 483

Ch. VII. Photodiodes and phototransistors -- 557

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SUB CODE: 09 SUBM DATE: 20Nov65/ ORIG REF: 154/ OTH REF: 090

Card 2/2 afs

YELISEYEV, S.A., Cand Tech Sci -- (diss) "Study of phase transformations in certain iron alloys." Mos, 1958, 8 pp including cover (Min of Higher Education USSR. Mos Order of Labor Red Banner Inst of Steel im I.V. Stalin) 120 copies (KL, 23-58, 106)

- 60 -

AUTHORS: Yeliseyev, S. A., Livshits, B. G. SOV/163-58-1-32/53

TITLE: The Comparison Between the K-State and the "Increasing Diffusion" in Some Iron Alloys (Sravneniye k-sostoyaniya i "voskhodyashchey diffuzii" v nekotorykh zheleznykh splavakh)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 1, pp 175-181 (USSR)

ABSTRACT: The effects K-state and "increasing diffusion" are two phenomena occurring in the steel melt. The formation of the K-state in iron alloys is characteristic of the increase in the electric resistance and the simultaneous increase in the hardness of the alloys. The "increasing diffusion" effect is also characterized by an increasing hardness and a decreasing electric resistance in the alloys. The two effects K-state and "increasing diffusion" were investigated and the differences were explained. In alloys in which no K-state occurs after annealing and hardening such an effect does not occur after deformation. There are 4 figures, 2 tables, and 11 references, 6 of which are Soviet.

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The Comparison Between the K-State and the "Increasing Diffusion" in Some
Iron Alloys

SOV/163-58-1-32/53

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: October 1, 1957

Card 2/2

SOV/126-6-4-12/34

AUTHOR: Yeliseyev, S.A.,
Ilyshits, B.G.

TITLE: Investigation of Phase Transformations in Certain
Iron-Base Alloys (Issledovaniye fazovykh prevrashcheniy
v nekotorykh zheleznykh splavakh)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6,
Nr 4, pp 657-661 (USSR)

ABSTRACT: There are large numbers of alloys which, in spite of
the fact that according to metallographic evidence they
consist (within a wide temperature interval) of one
phase only, may, in this temperature range, undergo
transformations accompanied by changes of their various
properties. Alloys of the composition corresponding to
the formulae $Ni_{1/2}Mn$ (Ref.1), $Ni_{1/2}Fe$ (Ref.2) and many
others, undergo a disorder-order transformation. Alloys
of the "Nichrome" type containing 20-30% Cr (Ref.3,4,8),
the iron-base alloys with 36% Ni and 1-8% Mo and
certain other materials are characterised by a
structural condition, stable at low temperatures and
referred to as the K-state. The disorder-order

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SOV/126-6-112/34

Investigation of Phase Transformations in Certain Iron-Base Alloys

transformations are accompanied by a decrease of the electrical resistivity of the alloy, while a transformation from the normal to the K-state results in an increase of this property. In both cases hardness is increased and some other properties are also affected. For obvious reasons, freedom from transformations of this type is very important in the case of single-phase alloys used for the preparation of wire strain-gauges, and the object of the present investigation was to ascertain whether such transformations occur in certain iron-base alloys. The main alloying constituent of the 5 investigated alloys was vanadium (8-14%). Alloys No.3 and 4 contained in addition 2.15 and 2.9% molybdenum, while alloy No.5 contained 1.15% aluminium. The carbon content of the alloys, whose complete chemical analysis is given on p 658, did not exceed 0.035%. High purity metals were used for the preparation of the alloys which were melted in argon, in a H.F. induction

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SOV/126-6-4-12/34

Investigation of Phase Transformations in Certain Iron-Base Alloys

furnace. After a homogenising treatment the cast ingots were forged to 8 mm diameter rods from which one group of experimental test pieces were prepared. In the first series of experiments, the as-forged specimens placed in evacuated ampoules and quenched from 1150°C were aged for 4 hrs at temperatures ranging from 350 to 650°C, and hardness H_v , electrical resistivity ρ , and magnetic saturation $4\pi J_s$ of the alloys both in the quenched condition and after ageing were measured. The results reproduced graphically on Fig.1 show that in the case of alloys No.1,2,3 and 4 (the Fe-V and Fe-V-Mo alloys) the heat treatment had no effect on any of the investigated properties. Since no characteristic points were observed on the dilatometric curves taken on the specimens of these alloys heated and cooled at the rate of approx 2°C/minute, and since in all known cases the disorder-order transformation and the transformation leading to the formation of the $\bar{\Gamma}$ -state occur in the temperature range employed in the present investigation, the experimental results were taken to indicate that no such transformations occur in these 4 alloys. On the

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Investigation of Phase Transformations in Certain Iron-Base Alloys

other hand, the electrical resistivity of alloy No.5 (the Fe-V-Al alloy) was slightly increased after ageing which indicated a small K-state effect, caused evidently by the aluminium addition. According to Kō Tin-sui (Ref.9), the causes and the mechanism of the onset of the K-state are the same as those of the Konobeyevski-Robenski effect, known also under the name of "anabatic diffusion" (Ref.6 and 7), the only difference being that in the latter phenomenon the atomic segregation takes place in the strain field, while the K-state is associated with atomic segregation in the regions surrounding dislocations. On the other hand, Hasiguti (Ref.10) who studied "anabatic diffusion" in plastically deformed brass postulated that this effect is also caused by atomic segregation in the vicinity of dislocations. If this were true, the changes of various properties due to both effects should be the same. However, while the onset of the K-state is accompanied by an increase of both hardness and electrical resistivity, intensive "anabatic diffusion" - which also results in an increase of hardness when a

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Investigation of Phase Transformations in Certain Iron-Base Alloys

plastically deformed alloy is annealed in a certain temperature range below the recrystallisation temperature - has been shown on the example of aluminium bronze (Ref.7) to cause a decrease of electrical resistivity. In order to ascertain whether the same applies in the case of other materials, and to find out whether an alloy in which no K-state is observed after quenching and ageing is free from this effect also when annealed after having been plastically deformed, the investigated iron-base alloys, previously subjected to 40% plastic deformation, were annealed at 400 and 450°C, and the variation of their hardness and electrical resistivity (H_v and ρ) was measured, the time-dependence of these properties being reproduced graphically on Fig.2 and 3. No evidence of "anabatic diffusion" was found in the case of alloy No.1, but it was observed in alloys No.2, 3 and 4 whose H_v increased and ρ decreased during the annealing treatment. In alloy No.5, the increase of H_v was accompanied by a slight (1%) increase of ρ , which indicated that in this case the transformation from normal to the K-state had occurred. It was concluded

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SOV/126-6-4-12/34

Investigation of Phase Transformations in Certain Iron-Base Alloys

from these results that: (i) Alloys in which no transformation to K-state occurs during ageing of previously quenched specimens, are also free from this effect while being annealed after having been subjected to cold, plastic deformation. (ii) The effects of a transformation from normal to the K-state are different from those of "anabatic diffusion". (iii) In iron-base alloys which contain elements characterised by the body-centred cubic crystal lattice, and in which no elements crystallising in the face-centred cubic lattice are present, the transformation from normal to the

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SOV/126-6-4-12/34

Investigation of Phase Transformations in Certain Iron-Base Alloys

K-state does not occur. There are 3 figures, 1 table and 11 references of which 6 are Soviet, 3 English and 2 German.

ASSOCIATION: Moskovskiy Institut Stali Imeni I.V.Stalina
(Moscow Steel Institute imeni I.V.Stalin)

SUBMITTED: 18th June 1957.

Card 7/7

30081
S/C48/61/025/011/027/031
B117/B102

15-2450

AUTHORS:

Livshits, B. G., Yeliseyev, S. A., Samarin, B. A., and
Somenkov, V. A.

TITLE:

Phase equilibrium in the Fe_2O_3 — BaO system

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 25, no. 11, 1961, 1418-1421

TEXT: The diagram of the quasibinary phase equilibrium of the Fe_2O_3 — BaO system was studied. The investigation involved structural analysis (by X-ray and optical microscopy), measuring the structure-independent (structurally insensitive) magnetic properties (saturation magnetization, Curie point), and measuring the microhardness of the individual phase. The specimens were prepared from Fe_2O_3 and $\text{Ba}(\text{NO}_3)_2$, and were sintered at different temperatures. Their compositions are given in a table. The microstructure was examined on specimens nos. 1-20 sintered at 1200°C for 8, 24, and 32 hr, and each of them was ground and pressed after 8 hours. The microstructure was also examined on specimens sintered at 1300°C for

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30081
S/O:8/61/025/011/027/031
B117/B102

Phase equilibrium in the ...

4 hr (nos. 1-9) and for 1 hr (nos. 10-12). Specimens no. 7 were found to consist of one phase, and specimens nos. 2-6 and nos. 8-20 to consist of two phases. The bright phase in no. 2-6 seemed to be hematite, whereas the dark one appeared to be barium hexaferrite $\text{BaO} \cdot 6\text{Fe}_2\text{O}_3$. The bright phase in nos. 8-20 was barium hexaferrite. The dark one could not be identified and was designated as X-phase. In almost all ferrites, the three phases showed constant hardness throughout the above-mentioned periods of time and at every sintering temperature. The saturation magnetization was examined on specimens of the quasibinary $\text{Fe}_2\text{O}_3 - \text{BaO}$ system after sintering at 1200°C for 8, 16, 24, and 32 hr, and by grinding them intermittently. The saturation magnetization as a function of composition, was found to have a maximum for specimen no. 7, and dropped linearly on either side of it. This shows that two phases exist in the ranges of 0-14.3% of BaO and 14.3-50% of BaO: a magnetic ($\text{BaO} \cdot 6\text{Fe}_2\text{O}_3$) and a nonmagnetic phase. It is hematite in the range mentioned first, and evidently $\text{BaO} \cdot \text{Fe}_2\text{O}_3$ in the other. The Curie temperature was measured on the same specimens. In the range of 14.3-50% of BaO the Curie point was

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S/048/61/025/011/017/031
E117/B102

Phase equilibrium in the ...

constant, which is indicative of the heterogeneity of this range. In the range of compositions from no. 7 to 9 the Curie point is lowered, probably due to the presence of a homogeneous region. In the range up to 14.3% of BaO the Curie point was anomalously reduced for specimens nos. 2, 3, and 4, after 16-32 hr of sintering. This is probably a consequence of the change in the composition or in the structure of the ferrimagnetic phase (barium hexaferrite). In specimens nos. 2-6, which were sintered at 1200°C for 24 and 32 hr, heterogeneity was established by means of X-ray structural analysis. The specimens sintered for 24 hr consist of hematite and barium hexaferrite. On an increase of the BaO content in the mixture, the hexaferrite lines become more intense, while the hematite lines turn weaker. In specimens sintered for 32 hr it was established that with increasing BaO content the lattice constant of barium hexaferrite increases on axis a, and drops somewhat on axis c. Changes in lattice parameters are quite insignificant. Still, they exceed the experimental errors; this should not occur in the heterogeneous region of the binary equilibrium diagram. There are 4 figures, 1 table, and 3 references: 1 Soviet and 2 non-Soviet. The reference to the English language publications reads as follows: Yasumasa Goto, Toshia Takada, J.

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30081

S/048/61/025/011/027/031
B117/B102

Phase equilibrium in the ...

Amer. Ceram. Soc., 43, 150 (1960).

X

Table: Compositions of examined specimens.

Legend: (1) no. of specimen; (2) molar ratio; (3) mole%, BaO.

Card 4/84

YELISEYEV, S.A.

Developing the microstructure of some ferrites. Zav.lab. 29
no.7:817-819 '63. (MIRA 16:8)

1. Magnitnaya laboratoriya AN SSSR.
(Ferrite--Metallography)

L 4452-66 EWT(1)/EWT(m)/FCC/T/EWA(m)-2/EWA(h) GW

ACC NR: AP5024620

SOURCE CODE: UR/0048/65/029/009/1631/1633

AUTHOR: Barashenkov, V.S.; Yeliseyev, S.M.

ORG: Theoretical Physics Laboratory, Joint Institute for Nuclear Research (Laboratoriya teoreticheskoy fiziki Ob'yedinennogo instituta yadernykh issledovaniy)

TITLE: Theoretical analysis of the interaction of elementary particles with atomic nuclei in the 10-1000 BeV energy region /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1631-1633

TOPIC TAGS: primary cosmic ray, secondary cosmic ray, pi meson, high energy particle, particle production, heavy particle,

ABSTRACT: Production multiplicities and energy, angular, and transverse momentum distributions of shower particles produced in 27-3500 BeV collisions of nucleons with C^{12} , Al^{27} , and Ga^{70} nuclei have been calculated, and the results are compared with cosmic ray observations. The development of the intranuclear cascades was calculated by methods previously employed at accelerator energies by one of the present authors (V.S.Barashenkov) and others (Nucl. Phys., 24, 642, 1961; 55, 79, 1964). The following additional assumptions were employed in the calculations: 1) 80 % of the secondaries produced in each inelastic interaction with a nuclear nucleon are pions, and 20 % are heavy particles; and 2) the multiplicity and the energy and angular distributions

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L 4462-66

ACC NR: AP5024620

of the secondaries depend only on the energy of the colliding particles and not on the nature of the colliding particles or the secondaries. The inelastic scattering was calculated with the optical model. Satisfactory agreement is shown with the experimental data. Poor agreement with certain more accurate angular distribution data is ascribed in part to systematic energy errors in nuclear emulsion data and in part to neglect of the exceptional role of nascent nucleons in the elementary act. A qualitative explanation for the previously unexplained bimodality of the angular distribution of shower particles in the $\log \tan \theta$ scale is found in the bimodality of the angular distribution of the particles produced in elementary acts within the nucleus. Orig. art. has: 2 figures and 3 tables.

SUB CODE: NP/ SUBM DATE: 00/

ORIG REF: 006/ OTH REF: 007

OC
Card 2/2

100115-67 (m)
ACC NR: AP0031660

SOURCE CODE: UR/0367/66/004/001/0156/01 0

AUTHOR: Artykov, I. Z.; Barashenkov, V. S.; Yeliseyev, S. M. 31

ORG: Joint Institute of Nuclear Research (Ob'yedinennyy institut yadernykh issledovaniy)

TITLE: Interaction of elementary particles with atomic nuclei in the energy region 1 - 30 Gev

SOURCE: Yadernaya fizika, v. 4, no. 1, 1966, 156-160

TOPIC TAGS: elementary particle, high energy interaction, high energy particle, statistic analysis, relativistic particle, pion, deuteron, proton alpha particle, particle collision

ABSTRACT: The authors present the results of statistical calculations of the interaction of protons with energies 6.2, 9, 17, and 25 Gev with emulsion nuclei. This is a continuation of earlier work, in which the model of intranuclear cascades followed by evaporation of nucleons, deuterons, and alpha particles from the residual nucleus, was used to explain the experimental data on proton-nucleus interactions at high energies. The present paper is devoted to more accurate calculations, carried out by the Monte Carlo method with account of the relativistic three-dimensional kinematics. The multiplicity of the particles produced in each inelastic πN and NN interactions was

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L 09415-67

ACC NR: AP6031660

determined by successively inserting the energies of the produced particles and trying to reconcile it with the average momentum spectra of the nucleons and pions until the total energy became larger than or equal to the total energy of the colliding particles. In all other respects the calculations were similar to those in the earlier work. The new data, together with the previously published ones, make it possible to state with sufficient assurance that at high energies, up to several dozen GeV, the interaction between the elementary particles and the atomic nuclei occurs essentially via the cascade-evaporation mechanism. At ultra-high energies, above 100 GeV, the situation is more complicated and many-particle interaction within the nucleus may play a major role. Orig. art. has: 3 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 25Jul65/ ORIG. REF: 009/ OTH REF: 012

Card 2/2 m.b.

YELISEYEV, S. N., KISELEV, B. M. (Moscow)

"An Exact Solution of the General Problem of Optimum Axisymmetric Shapes
in Flows with Detached Shocks."

report presented at the First All-Union Congress on Theoretical and Applied
Mechanics, Moscow, 27 Jan - 3 Feb 1960.

YELISEYEV Ye.V.

109-12-15/15

AUTHOR: Artemenkova, L.V.

TITLE: A Conference on Electron and Photo-electron Multipliers
(Konferentsiya po elektronnym i fotoelektronnym umnozhit-
elyam)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.12,
pp. 1552 - 1557 (USSR)

ABSTRACT: A conference took place in Moscow during February 28 and
March 6, 1957 and was attended by scientists and engineers
from Moscow, Leningrad, Kiev and other centres of the Soviet
Union. Altogether, 28 papers were read and discussed. The
papers were as follows:
1) B.M. Stepanov - "Some Problems of the Theory and Design of
Electron Multipliers".
2) Ye.V. Yeliseyev, I.S. Ipatkin, A.A. Kalmykov, K.V. Mikerov
and B.M. Stepanov gave some experimental data on electron
multipliers operating at large currents and voltages.
3) P.V. Timofeyev and Ye.G. Kormakova - "Electron Multipliers
of VEI (All-Union Electro-technical Institute)".
4) G.S. Vil'dgrube delivered a lecture on new types of
electron multipliers employing alloy emitters.
5) N.S. Khlebnikov - "New Types of Photo-electron Multipliers".

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109-12-15/15

A Conference on Electron and Photo-electron Multipliers

- 6) A.G. Berkovskiy et alii communicated some results on the new types of industrial photo-electron multipliers.
- 7) L.I. Andreyeva et alii - "Electron Optics of Certain Special Electron Multipliers and its Characteristics".
- 8) L.V. Artemenkova et alii reported some results on the study of the dispersion of electrons in electron multipliers and its effect on their resolving power.
- 9) L.B. Artemenkova and B.M. Stepanov - "Resolving Power of Electron Multipliers and its Experimental Determination"
- 10) A.G. Berkovskiy and L.G. Leyteyzen gave some results on the photo-electron multipliers suitable for the discrimination of short-time intervals.
- 11) G.A. Vasil'yev reported on an investigation of the transient characteristics of photo-multipliers by means of a micro-oscillograph.
- 12) A.I. Veretennikov considered the problem of the measurement of the transient characteristics of photo-multipliers.
- 13) E.Ye. Berlovich gave some data on the transient characteristics of the photo-multipliers, type Q3Y-19.
- 14) A.I. Belonosov determined the current time lag in the photo-multipliers, type Q3Y-19 and Q3Y-25.

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A Conference on Electron and Photo-electron Multipliers

- 15) Yu.A. Nemilov et alii also studied similar problems.
- 16) A.A. Osherovich investigated the basic parameters of the photo-multipliers, type ΦBY .
- 17) A.Ye. Chidakov proposed a simple method for the measurement of the amplitude resolution of the multipliers.
- 18) A.Ye. Melamid - "Parameters of Photo-electron Multipliers and the Methods and the Equipment for their Measurement".
- 19) B.M. Stepanov gave some data on the characteristics of a multi-channel electron multiplier operating at high currents.
- 20) B.M. Glukhovskoy and Ye.I. Tarasov - "The Activation Technology of Alloy Emitters with Various Photo-cathodes".
- 21) A.N. Pisarevskiy studied the problem of the application of the Soviet-made photo-multipliers to scintillation spectroscopy.
- 22) I.F. Barchuk reported on the application of a spectrometric photo-multiplier to a scintillation γ -spectrometer.
- 23) A.I. Akishin lectured on the special electron multipliers which could be employed for the counting of ions.
- 24) Ye.L. Stolyarova reported on the experiments with a spectrometric photo-multiplier with an NaJ(Te) crystal.
- 25) A.A. Samokhvalov and I.G. Fakidov communicated some data

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A Conference on Electron and Photo-electron Multipliers

on a simple scintillation counter, its characteristics and its application in γ -type flaw detection.

26) O.D. Kovrygin and G.D. Latyshev reported on the application of the photo-electron-multiplier, type $\Phi 3Y-12$, to the scintillation spectrometry and γ -type flaw detection.

27) N.G. Kokina gave some data on the application of electron multipliers to the monitoring of ultra-violet radiation.

28) N.K. Pereyaslova investigated the spectroscopic characteristics of the Soviet-made multipliers.

Very short summaries of the above papers are given.

SUBMITTED: July 3, 1957

AVAILABLE: Library of Congress

Card 4/4

GLUKHOV, I.A.; YELISEYEV, S.S.

A new oxchloride of pentavalent molybdenum - MoOCl_3 . Izv. Otd.
geol.-khim. i tekhn. nauk AN Tadzh. SSR no.1:79-82 '59. (MIRA 14:8)

Institut khimii AN Tadzhikskoy SSR.
(Molybdenum chlorides)

S/078/63/008/001/011/026
B101/B186

AUTHORS: Glukhov, I. A., Yelisseyev, S. S.

TITLE: Vapor pressure and thermal dissociation of molybdenum oxy-chloride MoOCl_3

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 1, 1963, 100-104

TEXT: During the sublimation of MoOCl_3 a disproportionation sets in at about 240°C , according to the equation $3 \text{MoOCl}_3 \rightleftharpoons \text{MoCl}_3 + \text{MoOCl}_4 + \text{MoO}_2\text{Cl}_2$. This process was investigated. The amount of nonvolatile MoCl_3 developed was determined by removing the residual MoOCl_3 through dissolution in H_2O . Analysis of the sublimate led to the empirical formula $\text{Mo}_2\text{O}_3\text{Cl}_6$. There exists, however, a mixture of MoOCl_4 and MoO_2Cl_2 which cannot be separated by fractionated sublimation, as proved with a 1:1 mixture of these compounds. The thermogram of the sublimate, too, showed endothermal effects at 102°C corresponding to the m.p. of MoOCl_4 , and at 152°C corresponding to the m.p. of MoO_2Cl_2 . Separation and identification of the

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Vapor pressure and thermal dissociation...

S/078/63/008/001/011/026
B101/B186

two components was carried out by extraction with CHCl_3 or CCl_4 , in which MoOCl_4 is better soluble. For the vapor pressure of MoOCl_3 , the following equation was found: $\log P_{\text{atm}} = 8.764 - 5484/T$, from which

$\Delta H = 25$ kcal/mole, $\Delta S = 40$ entropy units was calculated for the sublimation. By extrapolation it was calculated that the vapor pressure of MoOCl_3 amounts to 1 atm at 352°C , and that disproportionation sets in at 215°C . There are 3 figures and 2 tables. ✓

ASSOCIATION: Institut khimii Akademii nauk Tadzhikskoy SSR (Institute of Chemistry of the Academy of Sciences Tadzhikskaya SSR)

SUBMITTED: March 22, 1962

Card 2/2

GLUKHOV, I.A.; YELISEYEV, S.S.

Vapor tension and thermal dissociation of molybdenum oxychloride
 MoOCl_3 . Zhur.neorg.khim. 8 no.1:100-104 Ja '63. (MIRA 16'5)

1. Institut khimii AN Tadzhikskoy SSR.
(Molybdenum chlorides) (Vapor pressure)

YELISEYEV, S.S.

Thermodynamics of the reactions between chloro derivatives of
molybdenum and metal oxides, Dokl. AN Tadzh. SSR 6 no.3:
22-24 '63. (MIRA 17:4)

1. Institut khimii AN Tadzhikskoy SSR. Predstavleno chlenom-
korrespondentom AN Tadzhikskoy SSR V.I.Nikitinym.

YELISEYEV, S. V.

"Changes in Diameter Corrections Depending on Deformation of a Limb."
Sub 28 Feb 47, Moscow Inst of Engineers of Geodesy, Aerial Photography and
Cartography

Dissertations presented for degrees in science and engineering in
Moscow in 1947.

SO: Sum.No. 457, 18 Apr 55

YELISEYEV, S.V.

Yelisseyev, S.V. "Geodetic apparatus construction in the USSR,"
Sbornik nauch.-tekn. i proizvod. statey po geodezzi, kartograffii,
topograffii, aeros'yenke i gravimetrii, Issue 20, 1948, p. 71-80

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

YELISEYEV, S. V.

Yeliseyev, S. V. - "A new method of determining the corrections of diameters of circles of goniometric instruments", Sbornik nauch.-tekhn. i priozvod. statey po geodezii, kartopgráfii, topografii, aeros"yemke i gravimetrii, Issue 21, 1948, p. 80-88.

S0: U-4110, 17 July 53, (Letopis, 'Zhurnal 'nykh Statey, No. 19, 1949).

ENTIN, I.I.; SINYAGINA, V.I.; YELISEYEV, S.V., kandidat tekhnicheskikh nauk, redaktor.

[High-accuracy surveyor's NB level] Vysokotochnyi nivelir NB.
Moskva, Izd-vo geodesicheskoi i kartograficheskoi lit-ry, 1953.
118 p. (MLRA 7:8)
(Surveying--Instruments)

YABOVOY, Boris Dmitriyevich; YELISKEYEV, S.V., kandidat, tekhnicheskikh nauk, redaktor; IMOZEMTSWA, A.I., redaktor; KUZ'MIN, G.M., tekhnicheskii redaktor.

[Outline history on the development of geodetic instrumentation]
Kratkii ocherk razvitiia geodesicheskogo instrumentostroeniia
v SSSR. Pod obshchei red. S.V.Eliseeva. Moskva, Izd-vo geodes.
lit-ry, 1955. 95 p. (MLRA 8:11)
(Surveying--Instruments)

ARAYEV, I.P.; ~~YELISEYEV, S.V.~~, kandidat tekhnicheskikh nauk, redaktor;
KHROMCHENKO, F.I., redaktor; KUZ'MIN, G.M., tekhnicheskii redaktor

[Optical theodolites of average accuracy] Opticheskie teodolity
srednei tochnosti (tipa TB-1, OTM, OT-10). Pod obshchey red. S.V.
Eliseeva. Moskva, Izd-vo geodezicheskoi lit-ry, 1955. 150 p.
(Theodolites) (MIRA 8:6)

ROMANOV, Leonid Andreyevich. ~~YELISEYEV~~, S.V., kandidat tekhnicheskikh nauk, redaktor; KHROMCHENKO, P.I., redaktor; KUZ'MIN, G.M., tekhnicheskii redaktor.

[Technical leveling instruments] Tekhnicheskie niveliry. Pod obshchei red. S.V. Eliseyeva. Moskva, Izd-vo geodesicheskoi lit-ry, 1956. 58 p. (Leveling) (MIRA 9:6)

SOKOLOV, Mikhail Nikolayevich; YELISEYEV, S.V., kandidat tekhnicheskikh nauk, redakter; KHRONCHENKO, F.I., redakter; KUZ'MIN, G.M., tekhnicheskii redakter.

[Theodolites of medium accuracy and less] Teodolity maloi i srednei tochnosti. Pod obshchey red. S.V.Eliseeva. Moskva, Izd-vo geodezicheskoi lit-ry, 1956. 96 p.
(Theodolites)

SUDAKOV, S.G.; ALEKSANDROV, T.F.; YELISEYEV, S.V.; IZOTOV, A.A.; KUZ'MIN, B.S.; LARIN, D.A.; LEVINOV, B.A.; MOLODETSKIY, M.S.; POVALYAYEV, P.I.; RYTOV, A.V.; TIMOFEEV, A.A.; TOMILIN, A.F.; SHISHKIN, V.N.
KUZ'MIN, G.M., tekhnicheskii redaktor.

[Triangulation on the 1,2,3 and 4 order] Instruktsiya po triangulyatsii 1,2,3 i 4 klassov. Moskva, Izd-vo geodesicheskoi lit-ry, 1956. 307 p. (MLRA 9:5)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodezii i kartografiy. (Triangulation)

YELISEYEV, S.V., kandidat tekhnicheskikh nauk.

Selecting the magnification of the telescope for observing triangulation points. Geod. i kart. no.9:36-39 # '56. (MLRA 10:1)
(Surveying--Instruments) (Optical Instruments)

YELISEYEV, S. V.
VORONOV, Rostislav Vladimirovich, inzhener; YELISEYEV, S. V., kandidat
tekhnicheskikh nauk, redaktor; VASIL'YENKO, V. I., redaktor
izdatel'stva; ROMANOVA, V. V., tekhnicheskiy redaktor

[Optics in the manufacture of geodetic instruments] Optika v
geodezicheskoy priborostroyeni. Pod obshchey red. S. V. Eliseyeva.
Moskva, Izd-vo geodez. lit-ry, 1957. 132 p. (MIRA 10:7)
(Optical instruments) (Geodesy)

YELISEYEV, S. V.

207/14-18-2-17/22

Author: Bol'shatov, V. D., Candidate of Technical Sciences

Title: Scientific and Technical Conference of the NIIGA i K (Nauchno-tekhnicheskaya konferentsiya NIIGA i K) II

Periodical: Izvestiya vysshikh uchebnykh zavedeniy. Geodesiya i aerofotogrammetriya, 1958, No 2, pp 114-115 (USSR)

Abstract: G. A. Glinkin, Doctor, Candidate of Technical Sciences, spoke on "The Relations Between Distortions in Cartographic Projections." L. A. Bogomolov, Candidate of Technical Sciences, reported on "Topographical Deciphering from the Airplane and the Role of Aerial Photography in Cartographic Deciphering." A. S. Vasilov, Candidate of Technical Sciences, spoke on "The Relief Representation of Planes on Topographical Maps (Scale 1:10 000 000)." G. P. Kibler, Professor, Doctor of Geographical Sciences, dealt with the basic geographic structure of Antarctica and the consequent cartographical peculiarities of the region.

Engineer Ye. M. Fokistov reported on the conference held in the NIIGA i K (Moscow Engineering Institute of Geodesy, Aerophotography, and Cartography) from May 8 to 10. The participants discussed various questions in relation with the design of geodetical and cartographical instruments. More than 500 delegates from many universities and scientific institutions, as well as representatives of different agencies in Leningrad, Kiev, Sverdlovsk, and other cities, participated in this conference. The Deputy Head of the GDSK, M. D. Kon'shin, read a paper on "Scientific Research in Aerial Camera Design." S. V. Yeliseyev, Doctor, reported on "The Present State of Production of Geodetical Instruments, and Development of New Instruments." V. V. Bruyner, Professor, gave a lecture on the construction of photogrammetrical instruments in the USSR and on development of this field in the different sections of the instruments relating to the design of geodetical and cartographical instruments as well as instruments for aerial photography discussed. Doctor S. V. Yeliseyev and Engineer Ye. M. Fokistov reported on geodetic and measuring instruments. Engineer I. V. Meshcheryakov dealt with the new Marshapod-instruments. V. M. Masarov, Candidate of Technical Sciences, reported on optical range finders of greater precision, V. A. Velichko, Candidate of Technical Sciences, on optical range finders of medium accuracy. Engineer I. I. Andrianova and Ye. P. Popov, Candidate of Physical-Mathematical Sciences, spoke on modulators of optical range finders. Engineer L. V. Rabinovich spoke on the use of light alloys in the manufacture of geodetical instruments. Doctor S. M. Bruyner and Engineer V. E. Sayenko reported on new developments in the production of geodetical instruments. Professor D. Yu. Gal'perin dealt with the optical systems in geodetical instruments. Engineer A. S. Burago, Engineer S. A. Shilin, Doctor V. A. Kravtsov, Doctor I. S. Kirich, and Engineer A. V. Masarov informed the participants on the results of the Scientific and Technical Conference held in Kiev (Planning and Production of Geodetical Instruments).

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Card 2/3

Card 3/3

YELISEYEV, S.V., do's. kand. tekhn. nauk:

Designs and types of electronic range-finder equipment for mass production. Izv. vys. ucheb. zav.; geod. i aerof. no. 2:115-121 '57. (MIRA 11:7)

1. Moskovskiy institut inzhenerov geodezii, aerofotos'yemki i kartografii.

(Range finding--Equipment and supplies)

YELISEYEV, S.V., kand.tekhn.nauk.

Deformation of limbs in goniometric instruments used in geodesy.
Geod.1 kart. no.8:37-40 Ag '57. (MIRA 10:10)
(Goniometers)

Yeliseyev, S.V.

6-11-6/13

AUTHOR:

Yeliseyev, S.V., Candidate of Technical Sciences

TITLE:

The Development of the Construction of Geodetical Devices in the USSR (Razvitiye geodezicheskogo priborostroyeniya v SSSR)

PERIODICAL:

Geodeziya i Kartografiya, 1957,

Nr 11, pp. 39 - 44 (USSR)

ABSTRACT:

A survey is given of the development of the construction of geodetical devices during the past 40 years. At present the USSR disposes of a highly-developed optic-mechanical industry which produces devices that meet the newest requirements of modern science and technology. The development of the two oldest works "Geodeziya" and "Geofizika" is shortly described and it is stated that at the beginning of the thirties geodetic precision-instruments had still to be imported. It was not before the "TsNIIGA i K" and the design office of the "Aerogeopribor" works cooperated, that precision instruments could be produced in 1932 - 1934. In 1940 the optical precision-theodolite was completed. A great event was the production of the pilot wire of invar in the USSR. In 1950 the quantity production of the TT 2/6 triangulation-theodolite, the OT-02 optical theodolite and of other precision-instruments, among them the NB-2 precision leveling instruments,

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6-11-6/13

The Development of the Construction of Geodetical Devices in the USSR

was begun in the "Aerogeopribor" works. Since 1949 the DNB telemeter is produced in the same factory. In 1953 a light-telemeter model which possesses a high distance-accuracy of measurement up to 10 - 12 km (1 : 100 000) and high rapidity of measurement, was turned out. The production entirely meets the demand for geodetical devices.

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YELISEYEV, S. V. (Cand. Tech. Sci.)

"Modern tasks and the state of the construction of geodetical devices,"
Geodeziya i Kartografiya, 1957, Nr 12, 69-70 (USSR).

report presented at the Sci. Tech. Conf. for Geodesy, Aerial Photography and Cartography, 24 - 28 Oct 57, in honor of the 40th Anniversary of the October Revolution) Organized by Main Office for Geodesy and Cartography, Home Office USSR, the Military-Topographical Office and the Inst. for Engineering of Geodesy Air Survey and Cartography, Moscow.

YELISHYEV, Sergey Vladimirovich, dotsent, kand. tekhn. nauk; RUSINOV, M.M.,
prof., retsenzent; MORDASOV, M.K., retsenzent; PEFILOV, B.V.,
prof., retsenzent; SIKACHEV, V.A., red.; KHROMCHENKO, F.I., red.
izd-va; ROMANOVA, V.V., tekhn. red.

[Geodetic instruments and apparatus; principles of calculation
and design and specific features of manufacture] Geodezicheskie
instrumenty i pribory; osnovy rascheta, konstruktsii i osobennosti
izgotovleniya. Izd. 2., perer. i dop. Moskva, Izd-vo geodez. lit-ry,
1959. 478 p. (MIRA 13:4)

1. Kafedra optiko-mekhanicheskikh priborov Leningradskogo instituta
tochnoy mekhaniki i optiki (LITMO) (for Rusinov).
(Surveying--Instruments)

3(4)

AUTHOR:

Yelisseyev, S. V., Candidate of
Technical Sciences, Docent

SOV/154-59-1-1/19

TITLE:

Present State and Tasks in the Field of Developing the
Manufacture of Geodetical Apparatus (Sovromennoye sostoyani-
ye i zadachi po razvitiyu geodezicheskogo priborostroyeniya)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"-
yemka, 1959, Nr 1, pp 3-11 (USSR)

ABSTRACT:

The high standard attained in the manufacture of geodetical
apparatus in the USSR is pointed out and the new types of the
last 3 years are listed. The series production of high-prec-
sion apparatus is described, and it is stated that series
production of such devices abroad is much smaller. A short
survey of the development abroad is given, and it is found
that in a qualitative respect the manufacture of geodetical
apparatus has attained its greatest progress in West and
East Germany. The Moopta firm in Czechoslovakia has been
making optical theodolites and leveling instruments of
modern design since 1955. - The new branches of technology
are mentioned with the aid of which three physical processes
are engaged for geodesy: 1) The propagation of electro-

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Present State and Tasks in the Field of Developing
the Manufacture of Geodetical Apparatus

S07/154-59-1-1/19

magnetic waves at a certain velocity. 2) Transformation of the radiation of one spectral range into the radiation of another range, and transformation of energy of one kind into one of another kind. 3) Automatic control of high-speed processes. - The series production of the optical range finder SVV-1 in the USSR is mentioned in this connection. The "tellurometer" developed in South Africa in 1957 is described in short, and its faults are pointed out. - It is stated that at present all the elements required for building a completely automatized angle-measuring instrument (protractor) of high precision are already available. Modern electromechanics and electronics are able to carry out the full automatization of terrestrial surveys. The only obstacle to this are circumstances of technical organization. - The altimeter VA-1M designed in the USSR offers high accuracy at high speed of the vehicle (car) on which it is mounted by using an electromechanical compensation of the accelerations. Its mean deviation square is equal to ± 10 cm per km. The use of semiconductors permits the manufacture of an automatic altimeter which can be fitted to a bicycle.

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Present State and Tasks in the Field of Developing
the Manufacture of Geodetical Apparatus

SOV/154-59-1-1/19

A further automatic machine, the so-called "topobinder" ("topopriv'yazchik") permits to register the distance covered by a vehicle with an accuracy required for orientation on the ground. - The tasks given at present to the manufacture of geodetical apparatus - new devices, increase in quality, satisfaction of the demand - are pointed out. The problems of design mentioned at the Conference in Kiyev on the Manufacture of Geodetical Apparatus are described. - An important task is the renunciation to the old distance-measuring methods. The accuracy existing in the distance measurement with available devices is pointed out. A further important task is the building of small optical range finders with light portable feeding sources. More favorable are the prospects for substituting old devices for base measuring in triangulation. The principal task in triangulation is the reduction of signal heights. A separation of the antenna equipment from the receiver-transmitter in the tellurometer, and lifting the former to a great height might bring about a favorable solution. - Some tasks for the manufacture of apparatus are pointed out.

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Present State and Tasks in the Field of Developing
the Manufacture of Geodetical Apparatus

SOV/154-59-1-1/19

According to the development work carried out in the
TsNIIGAik (A. P. Kolupayev and N. A. Belyayev) it would be
convenient to devise the construction of an astronomical
universal apparatus.

ASSOCIATION: Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i
kartografi' (Moscow Institute of Geodesy, Aerial Survey and
Cartography Engineers)

Card 4/4

3(4)

AUTHORS:

1) Yeliseyev, S. V., Candidate of Technical Sciences, Doc nt, 2) Tret'yakov, V. A., Engineer SOV/154-59-1-10/19

TITLE:

Characteristics of the Construction of Modern High-precision Angle-measuring Instruments (Osobennosti konstruktseyi sovremennykh vysokotochnykh uglomernykh instrumentov)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos'yemka, 1959, Nr 1, pp 95-102 (USSR)

ABSTRACT:

The classical construction of a theodolite is the triangulation theodolite TT-2"/6" developed at the TsNIIGAIK by P. I. Shelavitelev, Ye. V. Fefilov, and I. A. Korol'kov according to the principles suggested by F. N. Krasovskiy. A survey on the development of this classical construction abroad is given here, and it is shown that in the construction of high-precision angle-measuring instruments preference should be given to the "optical" theodolites. The second part of the present paper shows that in the USSR "optical" theodolites of high accuracy are being developed at present. The triangulation theodolite TT-2"/6" and the optical theodolite OT-02 are produced at present by the zavod Aerogeoinstrument ("Aerogeoinstrument" Works). Individual drawbacks of

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Characteristics of the Construction of Modern High-precision Angle-measuring Instruments

SOV/154-59-1-10/19

these instruments are pointed out. At the end of 1957 the same factory produced an experimental type of the high-precision optical theodolite of the TVO-1 type. It serves for measuring horizontal angles and zenith distances in points of the triangulation of first order. The technical data of the instrument are given. Its most essential features are: the vertical axial system is a conical one, adjustment is done as for the TT-2"/6"; the telescope has an object-lens focal distance of 500 mm; the horizontal circle is made of glass with a diameter of 160 mm; one reading microscope for the vertical and horizontal circle and one wedge micrometer by means of which one can read off by two points (division lines); the instrument ensures normal work at temperatures between -25°C and $+50^{\circ}\text{C}$; the instrument has a put-on level with a graduation of 4", a level on the alidade of the vertical circle with a graduation of 10", a control telescope (which no other optical instrument has got) and optical centering; the main telescope is an astronomical telescope and consists of a double object lens with focusing lens, an optical micrometer (in form of a rocking plane-parallel

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Characteristics of the Construction of Modern High-precision Angle-measuring Instruments

SOV/154-59-1-10/19

small plate) and three exchangeable eyepieces. The instrument is being tested at present in the laboratory and at field work. According to preliminary statements, the results in the measurement of angles (in angle measuring) are the same as with the help of the triangulation theodolite TT-96. There are 6 figures.

ASSOCIATION: 1) Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii (Moscow Institute of Geodesy, Aerial Survey, and Cartography (Velis'ev); 2) Zavod Aerogeodezicheskikh instrumentov (Factory of Aerogeodetic Instruments) (Tret'yakov)

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ROMANOV, Leonid Andreyevich; ~~ELISEYEV~~, S.Y., kand, tekhn. nauk, red.;
KHROMCHENKO, P.I., red. izd-va; ROMANOVA, V.V., tekhn. red.

[Technical levels] Tekhnicheskie niveliry. Pod obshchey red.
S.V. Eliseeva. Izd. 2., ispr. 1 dop. Moskva, Izd-vo geodez.
lit-ry, 1960. 85 p. (MIRA 14:1)
(Level (Tool))

3.4000

AUTHOR:

Yeliseyev, S. V., Docent, Candidate of
Technical Sciences

66026 69626
S/154/60/000/01/014/017
B007/B123

TITLE:

On the Possibilities of Further Increasing the Precision of
Instruments for Angular and Linear Measurements

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos'yemka,
1960, Nr 1, pp 129-134 (USSR)

TEXT: In the first part of the present paper, a survey is given of the stage of
instrument construction and its different branches at home and abroad. The most
perfect ones are optical range finders with a relative error of $1 : 10^6$. The
admissible error in measurement of the geodimeter is $1 : 10^7$. The shortcoming
of optical range finders is the difficulty of using them during day-time.
The radio range finder, the so-called tellurometer, does not exhibit these short-
comings. In the USSR the optical range finders SVV-1²⁹ is already in use and the
large range finder EOD will be produced by the TsNIIGA i K (Central Scientific
Research Institute of Geodesy, Aerial Surveying, and Cartography). During field
investigations in 1958 the root mean square deviation of the direction of the
theodolite TT-2"/6" amounted to about $\pm 0",7$, and in 1959 during investigations
in the laboratory to $0",2$ (photoelectric recording of the direction). In 1959

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On the Possibilities of Further Increasing the Precision of Instruments for Angular and Linear Measurements

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B007/B123

a less disturbed photoelectric device for a theodolite with a straight telescope and an ocular micrometer was finished. When using photographic recording the reading errors are also reduced. These can still be more reduced by using a photoelectric microscope. One of the best constructions was suggested by Kulikovitch which is used at present for various instruments. A simple construction of equal precision is the one worked out by Engineer Ye. M. Feklistov (MIIGA i K) (Moscow Institute of Geodetic, Aerial Survey, and Cartographic Engineers). The possibilities of radio engineering and electronics are pointed out, and in this connection Vayssel' (Vayssel') and Van-Gil' (Van-Gil') are mentioned. In table 1 the technical data of foreign instruments and of the theodolite TVO of the zavod Aerogeodezicheskikh instrumentov (Plant for Aerogeodetic Instruments) are given. Two principally new constructions of instruments with the aid of which angles of direction can be obtained, are described. Although they do not yield high precision, the instruments are very large. Best results are achieved by gyroscopic instruments. In the second part of the paper, some theoretical problems concerning the increase in the accuracy of measurement are discussed. It is pointed out that without having the correct idea of the distribution of errors on graduated circle, the influence of these

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On the Possibilities of Further Increasing the
Precision of Instruments for Angular and Linear
Measurements

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errors can hardly be reduced. Taking the average of the results of measurement enhances the degree of accuracy essentially. Therefore, it is necessary to take the average quickly and to determine the average during the measuring procedure automatically. It is explained in short how one takes the average. The important influence of exterior conditions upon the measuring procedure is pointed out. Therefore, the environmental influences upon the results of measurement have to be carefully investigated. The Gosudarstvennyy opticheskiy institut im. S. I. Vavilova (State Optical Institute imeni S. I. Vavilov) is mentioned. There is 1 table.

ASSOCIATION: Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i karto-
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